

DNA PROTECTIVE POTENTIAL OF FORSKOLIN ON ETHYL METHANESULFONATE-INDUCED GENOTOXICITY



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Forskolin, a diterpene with multiple physiological effects, found in the root of the plant *Coleus forskohlii* (Willd.) Briq., is used in traditional medicine in the treatment of various diseases. Also, it has been proposed as a natural weight loss supplement.

Considering the widespread usage for therapeutic purposes and as a weight loss agent, a sex-linked recessive lethal (SLRL) assay was performed in germ cells of *Drosophila melanogaster* to assess genotoxic and possible DNA protective effects of forskolin on ethyl methanesulfonate (EMS)-induced DNA damage.

Table 1. Frequencies of sex linked recessive lethal mutations in the *Drosophila melanogaster* after the treatment with EMS and the post-treatment with forskolin

Broods		Treatments								
		S ^a	EMS ^b	F ^c	EMS+F	t _{S/EMS}	t _{S/F}	t _{S/EMS+F}	t _{EMS/F}	t _{EMS/EMS+F}
I	No of crosses	92	104	136	168	8.3	2.1	1.5	9.7	7
	No of lethal	12	64	6	34	p < 0.001***	p < 0.05*	p > 0.05	p < 0.001***	p < 0.001***
	% of lethal	13.04	61.5	4.4	20.2					
II	No of crosses	96	90	62	164	6.7	1.5	0.15	9.9	6.3
	No of lethal	10	44	12	18	p < 0.001***	p > 0.05	p > 0.05	p < 0.001***	p < 0.001***
	% of lethal	10.4	48.9	19.3	10.9					
III	No of crosses	64	108	86	74	5.3	0.02	0.76	5.3	4.6
	No of lethal	6	44	8	10	p < 0.001***	p > 0.05	p > 0.05	p < 0.001***	p < 0.001***
	% of lethal	9.4	40.7	9.3	13.5					
I+II+III	No of crosses	252	302	284	406	13.3	0.7	1.4	14	10.5
	No of lethal	28	152	26	62	p < 0.001***	p > 0.05	p > 0.05	p < 0.001***	p < 0.001***
	% of lethal	11.1	50.3	9.1	15.3					

The results are analysed by the test for difference in proportions, by simultaneous comparison with the positive and negative controls. Triple asterix indicates significantly higher frequency compared to EMS as positive control or to sucrose as negative control.

^aS; sucrose; negative control, 1%; ^bEMS; ethyl methanesulfonate, positive control, 0.75 ppm; ^cF; forskolin, 100 ppm.

The genotoxic effect of forskolin was tested at a concentration of 100 ppm for exposure periods of 24 h. To assess the DNA protective effect, *D. melanogaster* males were treated with EMS (0.75 ppm), 24 h prior to forskolin (100 ppm). Treated *D. melanogaster* males showed significant reductions in the frequency of sex-linked recessive lethal mutations in all three broods in comparison with the negative and positive controls. The genotoxic evaluation of forskolin by *in vivo* SLRL assay indicated that this compound did not induce any genotoxic effect and also exhibited a DNA protective potential against EMS.

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